

Heating system maintenance and troubleshooting tips

I had thought of writing an article along the lines of “getting to know your heating system”, but as with our own health, most of us take a keener interest when things go wrong. So, this is something of a first aid guide, aiming to help you diagnose and perhaps address some heating system issues, rather than immediately reaching for the phone and calling in a professional (which I hope will be me if you're in the St Albans area!).

As with health; maintenance, often neglected, acquires a higher priority after trouble.

First, a brief glossary of terms:

A **combi (combination) boiler** heats cold water destined for hot taps and showers instantaneously as it passes through the boiler. If your boiler fires pretty much as soon as a hot tap is opened, and has lots of pipes (typically six or seven) emerging from it, it's a combi. With a combi, there's no hot water cylinder.

Regular or **heat-only** or **conventional** boilers heat water flowing through them, and external devices, usually motorised valves, determine whether the circulating hot water heats the stored hot water cylinder or the radiators.

A **system boiler** is essentially a regular boiler that contains the circulating pump and is installed on a sealed system.

An **open-vented heating system** has a “feed & expansion” or “header” tank that provides the head of pressure for the system, automatically replaces any water lost via a float or “ball” valve, accommodates the expansion of the heating system water as it warms, and provides a safety pressure relief via the open vent pipe which bends over the tank.

A **sealed system** has no feed and expansion tank - an expansion vessel (commonly, but not exclusively, contained within the boiler case) provides a volume into which heating system water can expand as it warms. There is no automatic topping up of water - the only way water can enter the system, replacing any lost, is manually, through a filling loop. The safety or pressure relief valve releases water to outside via a pressure relief pipe if the pressure climbs too high. There is a pressure gauge to allow the pressure to be monitored - if the boiler houses an expansion vessel, it will also have a gauge.

Some noble souls have made very helpful videos which can be found on Youtube so if you need to see how to do something, it's well worth a look. For example, here's how to use re-pressurised a sealed heating system that has a flexible filling loop: <https://www.youtube.com/watch?v=BQ9tHmFm-xl>

My boiler isn't working

This assumes that the boiler isn't firing at all. The first thing to check, if your boiler is on a sealed system, is the water pressure as indicated at the pressure gauge or on the boiler display. Many boilers won't fire if the water pressure falls too low. If the pressure is indeed low, use the filling loop to introduce water and increase the pressure, aiming for 1 to 2 bar.

The next thing to check is that the boiler has electrical power - generally there's some light or display to indicate that the boiler is receiving power - if not, maybe a fuse in the plug or wall switch needs replacing.

If the boiler is showing some warning light or fault code, make a careful note of it as this may aid diagnosis and save you money - if you look in the boiler's manual, this may give you a clue as to the cause. Try resetting the boiler - consult the manual if you need to - many boilers have a reset button or switch position which is clear from the front panel - on old boilers it may be a case of turning off then restoring power.

If an overheat condition has occurred, which on some older boilers may require a recessed button to be pushed back in, the boiler itself may not be at fault - the cause could be poor circulation due, perhaps to a failed or failing circulating pump.

If there's no joy at this stage, you're probably going to need a professional.

I have central heating but no hot water (or vice versa) - combi boiler

The boiler is almost certainly faulty (eg diverter valve, flow sensor) and professional help is required.

I have central heating but no hot water (or vice versa) - regular or system boiler

In general, if this type of boiler works on either hot water or central heating, the fault lies elsewhere, typically with a motorised valve. These are usually located close to the hot water storage cylinder. Most properties have either one 3-port valve (three pipe connections) like this:



or two 2-port “zone” valves (two pipe connections) like this:



Try gently tapping the actuator (the box that sits on the pipework) - they can stick and this may free it.

If this isn't successful, the actuator will need to be replaced. In all but very old valves, the actuator head can be removed leaving the valve body in place, with no need to drain the system. If you're a competent DIYer capable of working safely on home electrics, you can do this yourself.

My (regular or system) boiler comes on at odd times regardless of the state of the programmer or thermostat

The device that actually tells the boiler to fire in very many systems with stored hot water, is a microswitch within a motorised valve actuator head. If the microswitch contacts close when they shouldn't, the symptom described will occur. Sometimes the contacts stay permanently closed and the boiler is permanently instructed to fire, or they can become intermittent.

My boiler comes on but quickly stops burning and the radiators don't get warm

This is probably a water circulation issue. The water circulating through the radiators is a cooling system for the boiler. If the circulation is poor, the boiler will rapidly get too hot and its safety systems will stop it burning gas. Circulation issues can be hard to diagnose because we can't see what's going on inside the pipework: there could be a blockage or the pump has failed or is in the process of doing so. If the pump is external to

the boiler, you may be able to tell by the sound it makes whether it's in good health. If the pump body is a lot hotter than the pipes feeding it, it's not in good shape and will need to be replaced.

The radiators upstairs get warm but those downstairs are cold

This could be due to a circulating pump failure.

The radiators downstairs get warm but those upstairs are cold

The system may be short of water. On a sealed system, check the pressure on the gauge, and if it's low, re-pressurise using the filling loop. On an open vented system, go in the loft and check the level of water in the small header tank. If it's empty, try moving the float valve which may have stuck.

After refilling the system, ensure the radiators are bled.

If water isn't the issue, the problem could be due to a failed zone valve.

One or two radiators stay cold

The first thing to check is the valves. If there is a TRV (thermostatic radiator valve), remove the head (often done by undoing a knurled ring several turns) and see if the now-exposed pin is free to move. If not pull it outwards by 5mm or so using a pair of pliers or grips. If it is stuck, lubricate (ideally with silicone spray), clean, and work backwards and forwards. The pin should gradually become relatively free to move.



At the other end of the radiator (or both ends if there's no TRV), will be a "lockshield" valve which may have a cap which can be pulled off or needs a retaining screw to be removed.



Try turning the valve backwards and forwards a few turns - again a spray lubricant and clean may help.

If a valve was the cause of the problem, you may hear water rushing into the radiator which will then need bleeding.

I have radiators that get mostly hot but are cool at the top

The radiator has air at the top and needs bleeding.

For good radiator tips watch the great man here: https://www.youtube.com/watch?v=wqku_Rc_YuI

I have radiators that get hot at the top but are cool at the bottom

This is a sign that corrosion has taken place and there's been a build-up of sludge at the bottom of the radiator. As the water can't flow there, it stays cool. The corrosion may be historical if the radiator is old - the main thing is to prevent on-going corrosion by:

- Maintaining system pressure which helps to keep air out.
- Bleed radiators whenever they're a little cooler than expected at the top.
- Maintain an adequate concentration of corrosion inhibitor (chemical) in the heating water.
- Equip the system with automatic air vents and de-aerators so that air bubbles can escape. The following device does this but will also rid the system of oxygen dissolved in the water (I have one):

<http://www.vortexenergysaver.com/>

No oxygen = no corrosion

If the less-than-perfect sludged-up radiator provides an adequate level of comfort, it can be left, as the sludge will probably stay put. Cleaning chemical can be added to the system, but I'd counsel against this unless a magnetic filter is in place to prevent dislodged debris from ending in the boiler and/or pump, causing trouble. If you want the system restored to peak condition, save up for a power-flush as although it is somewhat costly, it gets the dirt out of the system quickly and effectively.

<http://www.powerflushuk.com/>

My hot water is tepid but when I run the hot taps the radiators get warm

This is a combi boiler fault - most likely the diverter valve has failed or the plate heat exchanger's "primary" circuit (the closed circuit containing the heating system water) is becoming blocked, probably with corrosion debris.

The flow of water from all my hot taps is poor

Assuming a combi boiler, this will be an obstruction in the path of the mains cold water which is heated by the boiler and flows to the taps. The obstruction will likely be a filter blocked by incoming debris or limescale, or a plate heat exchanger blocked by limescale (in a hard water area).

My boiler is making noises

In normal service, the noise emitted by a relatively modern boiler will be predominantly from the fan. Fan that have worn bearings can become noisy, and the noise can be heard emerging from the flue outside the

property. Fans, provided they are not becoming stiff, can continue in this state for some considerable time.

Pumps can become noisy, and are located inside system boilers.

Another noise which can go all the way from gentle and barely audible to alarming, is "kettling", which is due to local boiling within the boiler's heat exchanger. Tiny bubbles of steam are believed to form at points of surface roughness inside the heat exchanger, over which the circulating heating water passes. These bubbles detach from the surface and collapse, making a sound like a boiling kettle. The noise will persist for a short time after the boiler has stopped firing. At its worst, kettling can sound like a demon trying to smash its way out of the boiler with a sledgehammer.

Kettling can be dealt with effectively and at modest cost by adding a specially formulated chemical to the heating system. Once apparent, kettling should be dealt with promptly - it is not good for the heat exchanger and can in bad cases, crack it, which may mean the boiler is beyond economic repair.

Any constructive feedback on this article would be greatly appreciated.

End of document